

ACUTE EFFECTS OF AIR POLLUTION ON PEDIATRIC ASTHMA ADMISSIONS IN ATHENS, GREECE

Evangelia Samoli, *Department of Hygiene, Epidemiology and Medical Statistics, Medical School University of Athens, Greece*

Panagiotis Nastos, *Laboratory of Climatology and Atmospheric Environment, Department of Geology and Geoenvironment, University of Athens, Greece*

Athanasios Paliatsios, *General Department of Mathematics, Technological Education Institute of Piraeus, Greece*

Klea Katsouyanni, *Department of Hygiene, Epidemiology and Medical Statistics, Medical School University of Athens, Greece*

Konstantinos Priftis, *Allergy-Pneumology Department, Penteli Children's Hospital, Athens, Greece*

Background and Aims: Several studies have reported adverse acute effects of air pollution on health, but most of them have focused on particulate pollution. We investigated the short term effects of particulate matter with aerodynamic diameter $<10\mu\text{g}/\text{m}^3$ (PM_{10}), sulfur dioxide (SO_2), nitrogen dioxide (NO_2) and ozone (O_3) on asthma emergency admissions in children aged 0-14 years old in Athens, Greece during 2001-2004. We explored effect modification patterns by season, sex, age and by the presence of desert dust transported mainly from the Sahara area.

Methods: We used daily time series data of pediatric asthma admissions from all the major children's hospitals in Athens and of the air pollutants as provided by the fixed monitoring stations' network. The associations were investigated using Poisson regression models allowing for overdispersion, controlling for seasonality, weather, day of the week, influenza and holiday effects. We applied separate stratified analysis by season, gender and age group.

Results: A $10\mu\text{g}/\text{m}^3$ increase in PM_{10} was associated with a 2.54% increase (95% confidence interval (CI): 0.06%, 5.08%) in the number of pediatric asthma admissions (during desert dust days: 4.12% (95% CI: 0.11%, 8.30%); non-desert days: 2.06% (95% CI: -1.01%, 5.21%)), while the same increase in SO_2 was associated with a 5.98% (95% CI: 0.88%, 11.33%) increase. O_3 was associated with a statistically significant increase in asthma admissions among older children in the summer. Our findings provide limited evidence of an association between NO_2 exposure and asthma exacerbation. Statistically significant PM_{10} effects were higher during winter and during desert dust days, while SO_2 effects occurred mainly during spring.

Conclusions: Our study confirms previously reported PM_{10} effects on emergency hospital admissions for pediatric asthma and further provides evidence of stronger effects during desert dust days. We additionally report severe effects of SO_2 , which in Athens are at a moderate level.